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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,702	08/30/2000	Brian A. Vaartstra	150.00800102	2471

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EXAMINER

BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 09/18/2002

10

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/651,702

Applicant(s)

VAARTSTRA, BRIAN A.

Examiner

Nicole M. Barreca

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 May 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 19-25,27-29,31,32 and 43-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-25,27-29,31,32 and 43-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 28 May 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6, 8, 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

1. Claims 19-25, 27-29, 31, 32 and 43-48 are pending in this application.

#### ***Claim Objections***

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 33-38 have been renumbered 43-48. ***Oath/Declaration***

3. The substitute declaration mailed on 5/28/02 has been received and approved by the examiner.

#### ***Drawings***

4. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 5/28/02 have been approved by the examiner. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 112***

5. The 35 USC 112, second paragraph rejections of claims 29 and 31 have been withdrawn in response to the applicant's amendments.
6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 25, 27-29, 31, 32, 43, 44, 47 and 48 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. While the specification has general support for using more than one oxidizer, such as on page 8, line 21 which recites "at least one oxidizer component", there is no disclosure in the originally filed claims or specification to support the criticality of specifically a composition comprising both a sulfur trioxide oxidizer and another oxidizer. Therefore claim 25, which recites a composition comprising a sulfur trioxide oxidizer in combination of another oxidizer, is not supported by the originally filed claims or specification. Also claim 27, which recites a composition comprising a first component (CO<sub>2</sub>, NH<sub>3</sub>, NO, CO, N<sub>2</sub>, He, Ne, Ar, Kr and Xe), a second component (oxidizers) and sulfur trioxide (oxidizer), is not supported by the originally filed claims or specification. Please note that in addition to being dependent on a rejected claim, the limitations recited in claims 29 and 31 are also not supported by the originally filed specification or claims because the specification on page 9 discloses volume ratios for only a two, but not a three, component composition. Also please note that the applicant's specification on page 8, lines 21-22 defines "additional components" as being components other than oxidizers.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 19-25, 27-29, 31, 32 and 43-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US Patent 5,013, 366) in view of Gupta (US Patent 5,037,506).

Jackson discloses a cleaning process for removing contaminants from a substrate by shifting the phase of a dense phase gas between temperatures above and below the critical temperature of the dense gas. The process may be used for removing photoresists, organic and inorganic materials from substrates (col.7, 1-32). The dense phase gas may also be a mixture of a first dense phase fluid, such as an oxidant, which chemically reacts with the contaminant to facilitate the removal and a second dense phase fluid which serves as a carrier. Examples of oxidants include ozone, oxygen, hydrogen peroxide or nitrous oxide. Examples of carriers include carbon dioxide, xenon, argon, krypton or ammonia. Example 1 teaches a dense gas mixture comprising 90% volume carbon dioxide and 10% volume nitrous oxide (9:1), while example 4 teaches a mixture of 75% volume carbon dioxide and 25% volume ammonia (3:1). See column 12, line 66 through column 14, line 8. While Jackson does not disclose that the oxidant is sulfur trioxide, the reference does teach that other materials which chemically react with the target contaminants, such as other oxidizers or materials

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which photodissociate such as ammonia and fluorine gas, may be used (col.12, 64-col.14,8). Gupta discloses a method of removing organic materials, such as implant and deep UV hardened photoresist, from a substrate by using sulfur trioxide. Sulfur trioxide is used to oxidize and remove all types photoresist layers, coatings and polymers from the surface of a device. Sulfur trioxide is an extremely strong oxidizing agent and is very effective in removing plasma hardened photoresist in post etch carbon-fluoride containing polymers from submicrometer grooves and crevices. The oxidizing power of sulfur trioxide is uniquely suitable for removal of side walled polymers. See column 3, lines 3-22. Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use sulfur trioxide as the oxidizing agent in the supercritical fluid composition in the contaminant removal method of Jackson because Gupta teaches that sulfur trioxide is an extremely strong oxidizing agent which is very effective in the removal organic materials, such as photoresists.

### ***Response to Arguments***

10. The 35 USC 102 rejections have been withdrawn in response to the applicant's amendments (Niahikawa, Chao, Jackson) or remarks (Vaartstra).

11. With respect to the 35 USC 103 rejection, applicant's arguments filed 5/28/02 have been fully considered but they are not persuasive. The applicant argues that neither Jackson, Gupta or the combination thereof teach or suggest a composition including sulfur trioxide in the supercritical state. Jackson teaches a composition comprising oxidizers and carrier gases, both in the supercritical state. Gupta teaches that sulfur trioxide is a strong oxidizer which is uniquely suitable for removal of side

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walled polymers and was used for this teaching only. Therefore the combination of Jackson in view Gupta does teach a composition including sulfur trioxide in the supercritical state, as discussed above.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for

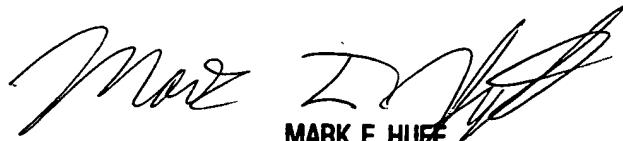
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the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

nmb

September 17, 2002



MARK F. HUFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700